

CLAIMS:

1. A wireless sensor device comprising:

a sensor configured to sense a target object and provide a sensor signal of varying levels indicative of condition of the target object;
a signal processing circuit configured to amplify said sensor signal to give an amplified electric analog signal;
a detection circuit configured to receive said amplified analog signal and provide a detection output (Dout) when said electric analog signal goes beyond a predetermined detection threshold;
a radio transmitter configured to transmit a radio detection signal (RS) in response to said detection output;
a power supply configured to provide an electric power to said signal processing circuit, said detection circuit, and said radio transmitter; and
a power generating element converting an external energy into said electric power to be accumulated in said power supply.

characterized in that

a controller is provided to activate said radio transmitter only in response to said detection output, permitting said radio transmitter to generate said radio detection signal.

2. The wireless sensor device as set forth in claim 1, wherein
said radio transmitter comprises:

a regulator connected to receive said electric power from said power

supply and configured to give an operating voltage for a short time period only upon receiving said detection output (Dout) from said detection circuit;
a clock configured to be activated upon receiving said operating voltage to provide a clock signal;

a pulse generator configured to generate, based upon said clock signal, short pulses identifying the presence of the detection output; and

a driver configured to be activated upon receiving said operating voltage from said regulator so as to radiate said short pulses as said radio detection signal through an antenna.

3. The wireless sensor device as set forth in claim 1, wherein

said controller is configured to provide a normal mode of operating said signal processing circuit at a rated power to obtain said electric signal (Vout) of rated amplitude proportional to said rated electric power, and a sleep mode of operating said signal processing circuit at a reduced power for obtaining said electric signal (Vout) of low amplitude proportional to said reduced electric power,

said detection circuit being configured to have a wake-up threshold which is lower than said detection threshold,

said controller being configured to switch said normal mode to said sleep mode when said electric signal (Vout) of rated amplitude becomes lower than said detection threshold, and to keep said sleep mode until said low amplified electric signal goes beyond said wake-up threshold, and

said detection circuit being configured to give said detection output (Dout) when said electric signal (Vout) of rated amplitude goes beyond said

detection threshold in said normal mode.

4. The wireless sensor device as set forth in claim 3, wherein

said sensor is an infrared ray sensor for detection of a motion of said target object of generating infrared ray, said sensor providing said sensor signal which varies in positive or negative directions in response to the motion of said target object,

said detection circuit having a threshold selector which provides a detection range (A1-A2) defined by upper positive and lower negative ones of said detection threshold, and also a wake-up range (B1-B2) defined by upper positive and lower negative ones of said wake-up threshold,

said detection circuit including a comparator unit which receives said detection range and said wake-up range selectively from said threshold generator,

said comparator unit generating a first signal (Cout) either when said electric signal (Vout) of rated amplitude goes beyond said detection range or when said electric signal (Vout) of low amplitude goes beyond said wake-up range, and otherwise generating a second signal (Cout),

said controller selecting said detection range in response to said first signal (Cout), and selecting said wake-up range in response to said second signal (Cout), and

said detection circuit providing said detection output only upon seeing said first signal (Cout) in said normal mode.

5. The wireless sensor device as set forth in claim 4, wherein

said detection circuit includes an output provider configured to generate said detection output (Dout) when receiving said first signal from said comparator unit at an input of said output provider,

said input being connected to receive said first signal from said comparator unit through a switch which is controlled by said controller to close only in response to said first signal.

6. The wireless sensor device as set forth in claim 3, wherein

said controller is connected to monitor a level of said electric power accumulated in said power supply and to keep said normal mode and disable said sleep mode while said electric power is higher than a predetermined power level.

7. The wireless sensor device as set forth in claim 1, wherein

said sensor is provided for sensing an illumination level and is defined by a photovoltaic cell which converts light into electrical energy, said photovoltaic cell also defining said power generating element for accumulating the electric power into said power supply.